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# SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE  
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FRIDAY, MAY 17, 1901.

THE PLAGUE IN SAN FRANCISCO.

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In the spring of 1900 the city bacteriologist of San Francisco and the quarantine surgeon of the Marine Hospital Service, stationed at Angel Island, San Francisco Bay, made the discovery that the death of a Chinaman had been caused by plague. In accordance with the provisions of the laws governing these two officers in their respective functions, the case was officially reported. Other cases soon developed, and the occurrence of these cases was likewise officially reported. The reports of the quarantine surgeon were published in the Public Health Reports of the Marine Hospital Service in accordance with law and with international agreements. The truth of the reports was at once questioned by the larger portion of the local public press, the objections being partly of a political and partly of a commercial character. A certain portion of the medical profession also opposed the recognition of the diagnosis, and the opinions of these physicians constituted the basis of the denial by the press of the truth of the existence of plague. The diagnosis had been established in accordance with the conceptions of plague as determined by the scientific study of the

disease in the Orient by Yersin and Haffkine, and by the various plague commissions which were sent to the Orient by various European governments for the study of plague; in short, the diagnosis was established precisely as it was in India, China, Japan, Portugal, Alexandria, Sydney and Cape Town; and the fact that the scientific methods, which in the countries quoted are unreservedly accepted as trustworthy and reliable, were in San Francisco disregarded and ridiculed is a sad commentary upon that portion of the medical profession which maintained the negative attitude.

Fearing that the State Board of Health might quarantine the city and that other States might quarantine the city, or even the State, to the vast injury of public and commercial interests, the commercial interests of the city solicited the establishment by the City Board of Health of a quarantine of 'Chinatown,' the portion of the city occupied by the Chinese in which all the reported cases had occurred. This request was acceded to, and the quarantine was established. At the solicitation of the railway companies, the Marine Hospital Service, through its surgeon-general in Washington, though against the protest of the surgeon stationed at Angel Island, laid a similar quarantine against 'Chinatown.' The public was given to understand that plague was a disease of frightful contagiousness and rapid spread, and that this quarantine was necessary to prevent the spread of the disease through the entire city. The quarantine, though inadequately enforced and obviously ineffective, was quite naturally

obnoxious to the Chinese residents of the quarantined area, and they sought relief in the courts.

In the opinion rendered upon the case, Judge Morrow decided the establishment and maintenance of the quarantine illegal, but marred what was, under the laws, a correct decision by the prejudicial and unwarranted statement that no cases of plague had existed in San Francisco. That the quarantine was, in the light of our knowledge of plague and in the light of the Oriental experiences with the disease, an unwarranted and mistaken procedure is obvious. As a rule plague is not a personal infection, it is a house infection; the best evidence of this fact is the statement of one of the European commissions that about the safest place in Bombay is the plague hospital. As a general rule plague may be said to become a personal infection only when the pneumonic form is prevalent, and even under such circumstances the sensitiveness of the *Bacillus pestis* to sunlight and desiccation renders the infectiousness of the disease much less than is observed with other infections. As stated, the public in San Francisco had been led to believe that plague was a disease of frightful contagiousness; when then the quarantine was raised, and the Chinese population was allowed to go where it chose in the light of the aforesaid information, the disease was expected to spread at once through the city. It did, of course, nothing of the sort. And naturally the general public at once lost confidence in the local board of health and in the correctness of the diagnosis.

Following this date fresh cases occurred from time to time, and the occurrence of these cases was officially reported by the city bacteriologist and by the surgeon of the Quarantine Station of the Marine Hospital Service. The public press then began a campaign of personal abuse of Surgeon Kinyoun, the quarantine surgeon of the Marine Hospital Service, though this officer had done nothing but follow his orders and obey the law. Matters dragged on until the opening of the State Legislature. In his message, his Excellency Governor Gage denied the existence of plague in the State and passed severe strictures upon the surgeon of the Marine Hospital Service. A motion was then introduced into the Legislature requesting the National Government to recall surgeon Kinyoun, the implication again being that Dr. Kinyoun had exceeded his authority, a charge which was entirely unfounded, as every other surgeon in the service would of necessity have done exactly as did Dr. Kinyoun. Dr. Kinyoun thereupon demanded an investigation of the hygienic state of affairs in San Francisco. The Treasury Department thereupon sent to San Francisco a special committee composed of men of international reputation as experts in matters of the kind, men entirely without connection with the Marine Hospital Service, and in fact connected with large institutions of public learning. The committee consisted of Professor Flexner, of the University of Pennsylvania, Professor Novy, of the University of Michigan, and Professor Barker, of the University of Chicago.

Upon the advent in San Francisco of

these gentlemen, bills were introduced into the State Legislature making it a criminal offense for any one to report the existence of plague without the confirmation of the State Board of Health, and prohibiting the handling of cultures of the *Bacillus pestis* as prejudicial to the public health; these bills were not pushed, and did not pass; they are mentioned simply to illustrate the mental attitude from which they sprang. It had been previously charged that the bacteriologists reporting the cases of plague had intentionally infected with the *Bacillus pestis* the bodies of Chinamen dead of other causes, in order to bolster up their diagnoses; this absurdly vindictive charge is repeated simply to illustrate to what an appalling extent of mental and moral error prejudice will carry men. The special commission spent several weeks in San Francisco, saw and studied six cases of plague, and presented a report confirming the existence of the disease in the city. On the receipt of the information of the contents of this report, a committee of citizens went to Washington, and an agreement was entered into with the national authorities, that the city of San Francisco and the State of California were to furnish the funds wherewith the section of the city known as Chinatown was to be cleaned and disinfected under the supervision of an officer of the Marine Hospital Service, and this disinfection is now in progress.

That the existence of plague in San Francisco has been of considerable commercial loss to the State is without question. That the misfortune of the occurrence of plague in San Francisco must, in the

nature of things, have been attended with some commercial loss is obvious. The men who have maintained the existence of the disease have the interests of the State as closely at heart as have those who have opposed the diagnosis ; they differ in their convictions as to the best and least injurious method of procedure. The men who have maintained the existence of plague reason thus : Plague is here ; clinically, pathologically and bacteriologically it has been proved to be here. Under the circumstances the best method of procedure, the one affording the best protection to the public health and the least injury to the business interests of the State, is to acknowledge the truth, undertake energetic measures, and clean and disinfect 'Chinatown' in such a manner as to stamp out the disease at once. The opposition comprises two sets of men. One set does not believe that plague is here, and for them there can be no necessity for hygienic action. Though honest in their convictions, it must be insisted on that the existence of plague is a matter for scientific consideration, and is not within the scope of the judgment of business men. The second class realizes that the disease is present, but reasons that, as there are so few cases and as these are largely confined to Chinese, the situation is not serious and should be concealed in the hope that the disease will die out, and that public recognition and active hygienic measures should be deferred until the conditions become so serious that the public health is gravely jeopardized. The scientists know that there are but few cases, that the general

health is not in serious danger, but believe it better to stamp out the infection while in its infancy, with the attendant small commercial loss, than to wait, in the hope that the disease will die out of its own accord, until the situation shall have become very serious, with the risk of overwhelming commercial losses in the event of a generalization of the infection.

There can be no question that the first course was the correct one. That now, one year after the trouble began, the State is compelled to do what it all along refused to do, undertake the hygienic renovation of 'Chinatown,' is an obvious proof of the correctness of the frank and open course. Had the Chinese section been promptly and effectively cleaned one year ago, the disease would have been stamped out at little cost, and the episode would have been ere this forgotten. At present the pall still hangs over California, and there is a general distrust of her on the part of the other States. We trust that the present measures will prove effective, and that the State has escaped the occurrence of a serious epidemic ; but this escape will have been purely accidental, and in matters like these a community has not the right to trust to the fortune of chance.

Conditions have apparently not been favorable to the immediate spread of the disease. This is, however, an old experience ; in many places and at many times the plague has dragged along for a long while, only to suddenly flare up into an active epidemic. The recent experience in Cape Town is a fresh illustration. The plague has been present and dragging along in

Cape Town for eighteen months; on account of the military situation, its effective eradication was neglected, and now the disease has roused into active form. It is this risk which San Francisco has been running, and this risk no community has the right to assume.

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*THE DESTRUCTION OF SEA LIONS IN CALIFORNIA.*

PROFESSOR WOODWARD'S wholesome address on the necessity of verifying theories by the observation of facts finds an excellent illustration in the sea lion question in California. These animals, which have long been prized by lovers of nature as one of the great attractions of the coast, have fallen into disrepute among the fishermen because their presence was supposed to account for the deterioration of certain fishing grounds. So confident was the belief in their fish-devouring habits that their destruction—or at least a great reduction of their numbers—was advocated and in part accomplished by the State Commission of Fisheries. But it now appears that this belief was without substantial foundation. The appeal to fact has been made by the critical examination of the stomachs of slaughtered sea lions, and it has been found by Professor Dyche that the twenty-five animals examined had eaten only squids and other cephalopods, eschewing fish altogether. The case is suggestive of the old philosophical puzzle: Why is it that a live fish adds nothing to the weight of a bucket of water? and would be amusing but for the sad fact that the unfounded theory has already led to the killing of many of these graceful creatures.

The investigation of food-habits by means of stomach examination is of far-reaching importance. Dr. Merriam, whose letter on sea lions we print on another page, is engaged, through the Biological Survey, in the most elaborate

study of animal foods ever made. For many years the stomachs of wild birds and mammals have been systematically collected and laboriously studied, to the end that the favorite and the occasional foods of each species in each season of the year, and in each part of the country, may become known. As each group is worked up the facts are published by the Department of Agriculture, and farmers and legislators are thus informed what species may properly be regarded as friendly, and what as hostile, to the interests of the people. In many instances it has been found that popular impressions, almost necessarily founded on a comparatively small number of facts, are altogether erroneous, so that war has been waged on our friends and protection given our enemies.

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*ON THE VITAL ACTIVITY OF THE ENZYMES.\**

IN spite of the vast amount of work that has been done on the soluble ferments, since the discovery of diastase by Kirchoff, in 1814, the exact chemical nature of these substances is, perhaps, even more of an enigma to-day than the nature of albumen itself. Indeed, beyond the fact that the enzymes, or at least the greater number of them, are albuminous, that they probably belong to the group of nucleo-proteids and that they contain phosphorus, and probably iron, in addition to carbon, hydrogen, oxygen and nitrogen, we know but little more concerning their exact chemical composition than was known to Payen and

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\* In slightly different form this paper was read before the Cincinnati Section of the American Chemical Society, December 15, 1900.

Many of the biological memoirs referred to in the following were inaccessible to the writer in the original. He, therefore, desires to acknowledge his indebtedness to the following authorities: 'The Soluble Ferments and Fermentation,' Green; 'Die Fermente und Ihre Wirkungen,' Oppenheimer; 'The Cell in Development and Inheritance,' Wilson; 'Plant Physiology,' Sachs; 'Plant Physiology,' Pfeffer; Hueppe's 'Principles of Bacteriology,' Jordan.